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Case Report

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A rare case with atypical findings: schwannoma of the radial nerve

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ABSTRACT

A 53-year-old male complained of weakness in the dorsum of the 5-4-3rd fingers of the right hand. The musculus extensor digitorum communis was heavy and the musculus extensor indices proprius was light involved in the needle electroneuromyography study. Radial nerve ultrasonography showed a mass (schwannoma) which located on the radial nerve course after the lateral epicondyle at the elbow level. In conclusion, we should consider radial nerve schwannoma in patients with radial nerve injury and when there is an atypical involvement of the muscles innervated by the radial nerve, we should utilize ultrasonography for evaluation.

Keywords: Schwannoma, radial nerve, electromyography, ultrasonography

INTRODUCTION

Schwannomas are the most common tumors of peripheral nerves composed of neural crest-derived Schwann cells. They are benign and generally solitary.[1,2] Sometimes there can be multiple lesions associated with neurofibromatosis. They usually grow slowly and the diagnosis is delayed and difficult as neuronal adaptation develops.[2] Schwannomas are located at the the flexor surfaces of the upper and lower extremities.[3,4] The radial nerve's schwannomas at the extensor compartment are very rare.[4] Herein, we present a rare case of schwannoma of the radial nerve presenting with finger weakness and atypical examination and EMG findings.

CASE

A 53-year-old male complained of numbness in the dorsum of the 5-4-3rd fingers of the right hand 3 years ago. Weakness was added to the complaint of numbness over time. The patient had no history of trauma. The extansor carpi ulnaris, extansor indicis proprius and abductor pollicis brevis muscle strengts were found 4/5 (according to the Medical Research Council Muscle Strength Scale). The extansor digitorum communis muscle strength was found 1/5. In sensorial examination, Right C6-7-8 ve T1 dermatoms were hypoestesic. Deep tendon reflexes were normoactive and there were no pathologic reflexes. Electrophysiologic study was made for the diagnosis. In right radial superficial nerve sensory nerve conduction study, sensory nerve conduction velocity was decreased and the sensory nerve action potential amplitude was reduced. Also in right radial nerve motor nerve conduction study, nerve conduction velocity was decreased and the motor nerve action potential amplitude was reduced. Right median nerve motor and sensory nerve conduction studies were shown that he had moderate carpal tunnel syndrome. Right ulnar nerve motor and sensory nerve conduction studies were normal. Needle electromyography (EMG), findings were summarized in Table. EMG revealed chronic damage to the right radial nerve after it branches to the musculus extensor radialis longus and moderate carpal tunnel syndrome. Since the patient's musculus extensor digitorum communis strength (according to the Medical Research Council (MRC) Muscle Strength Scale) was 1/5 and the musculus extensor indices proprius strength was 4/5 and the musculus extensor digitorum communis was heavy involved and the musculus extensor indices proprius was light involved in the needle EMG study, radial nerve ultrasonography (USG) was performed because of the suspicion about the etiology of radial nerve injury. Ultrasonographic examination showed a mass which located on the radial nerve course after the lateral epicondyle at the elbow level (Figure-1a and 1b). Contrast-enhanced Magnetic resonance imaging (MRI) of the patient revealed a lesion in the right radial nerve with a diameter increase of approximately 2 cm in the proximal part of the antecubital region, isointense on T1-weighted MRI (Figure-2a), hyperintense on T2-weighted fatsat MRI (Figure-2b), with marked contrast enhancement in the post-contrast series (Figure-2c), and the lesion was primarily evaluated in favor of schwannoma.

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Table 1. The needle EMG findings of case

Right	Extansor indicis proprius	Extansor digitorum communis	Extansor carpi ulnaris	Extansor Carpi radialis longus	Brachioradialis	Triceps brachi	Abductor pollicis brevis	First dorsal interosseus
Spontaneous activity								
Abnormal spontaneus activity	-	-	-	-	-	-	-	-
MUAP analyses								
Amplitude (Mv)	0.5-5	0.5-5	0.5-5	0.5-3	0.5-3	0.5-3	0.5-5	0.5-3
Duration (msec)	5-19	5-19	5- 9	5-15	5-15	5-15	5-19	5-15
Polyphasic MUAP ratio	Normal	increased	Normal	Normal	Normal	Normal	Normal	Normal
Recruitment pattern	↓	↓↓↓	↓↓	Normal	Normal	Normal	↓	Normal

(-): No abnormal spontaneous activity; (+): Abnormal spontaneous activities, MUAP: Motor unit action potential, Abnormal values are written in bold

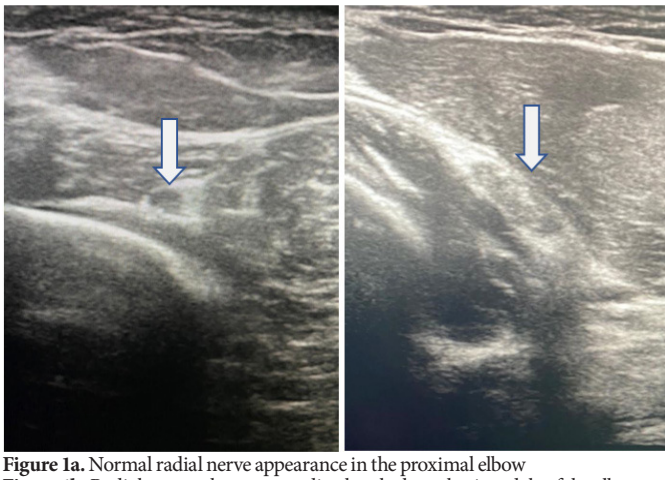

Figure 1a. Normal radial nerve appearance in the proximal elbow
Figure 1b. Radial nerve schwannoma distal to the lateral epicondyle of the elbow

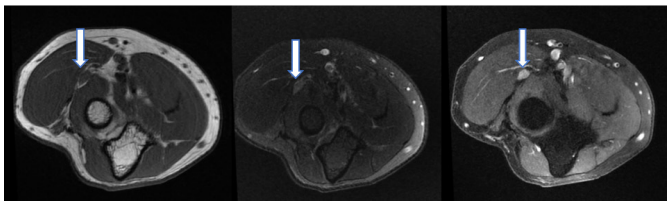

Figure 2a. The lesion is isointense on T1-weighted MRI
Figure 2b. The lesion is hyperintense on T2-weighted fatsat MRI
Figure 2c. The lesion is with marked contrast enhancement in the post-contrast series

DISCUSSION

Here, we report a rare case of radial nerve schwannoma presenting with weakness in the extensor muscles of the hand fingers, diagnosed by ultrasonography and EMG. The schwannoma is usually seen in 30 to 60 years old patients and our patient was in the common age range reported in the literature.[5] The frequency of radial schwannomas is 7% but in the literature, there is a few case reports.[6] According to the literature, median and ulnar nerve schwannomas are the most common peripheral nerve schwannomas.[7,8] Pain and paresthesia are generally seen as the symtoms.[4] Our patient had no pain and he had numbness and serious weakness. Patients with schwannomas can be delayed up to 37 years in being diagnosed and undergoing surgery.[5] Pertea et al.[8] reported that their patients had symtomps since 2-5 years. Our patient was diagnosed in the 3rd year after the onset of symptoms. If our case had not had weakness in hand muscle strength, it may have been diagnosed later or not diagnosed at all. Like the other tumoral lesions, USG and MRI are useful for diagnosis of schwannomas. Schwannomas are homogeneous, hypoechoic lesions and origin the nerve on USG.[9] On MRI, schwannomas are seen as bright in T2-weighted images similar to our case.[10] Perhaps we performed EMG 3 years later, after the beginning of symptoms, any abnormal spontaneous activity was not found in our case. But there were chronic dennervation findings in extansor digitorum communis, extansor carpi ulnaris and extansor indicis proprius muscles.

Radial nerve schwannomas in the literature, usually presented with pain and paresthesia and were diagnosed by MRI or USG. Unlike the literature, our case presented with slowly developing paresthesia followed by weakness. There are few cases of schwannomas with clearly defined EMG findings in literature. Depending on the way the tumor involves the nerve fiber, the EMG may be completely normal. In this case, the heavy involvement of the extensor digitorum communis muscle and the lighter involvement of the extensor indis proprius muscle seem to be related to the invasion of the tumor to the nerve fibers. We think that this case contributes to the literature because of the difference in symptoms, examination and EMG findings and the inclusion of detailed EMG findings. It is also one of the cases showing that ultrasonography is very important in the differential diagnosis of nerve lesions. In this respect, it makes a significant contribution to the literature.

CONCLUSION

In this case, we present a rare case of radial schvannoma. This case showed us that we should consider radial nerve schwannoma in patients with radial nerve injury but atypical involvement of the muscles innervated by the radial nerve on neurologic examination and EMG findings, we should utilize ultrasonography of the radial nerve in the evaluation of such patients.

ETHICAL DECLARATIONS

Informed Consent

Patient signed the free and informed consent form.

Conflict of Interest Statement

The authors have no conflicts of interest to declare.

Financial Disclosure

The authors declared that this study has received no financial support.

Author Contributions

All of the authors declare that they have all participated in the design, execution, and analysis of the paper, and that they have approved the final version.

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